ADA Accessibility Guidelines Online Education Course

Course Supplement

Acknowledgements

The AIA wishes to acknowledge the generous contributions of the Access Board, who initiated this important project. The Access Board provided funding and aided in developing the program for the course. Their invaluable efforts will help educate architects about the guidelines for the design and construction of accessible judicial, legislative, and regulatory facilities; detention and correctional facilities; and building elements designed for children's use.

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Welcome

Welcome to the American Institute of Architect's on-line continuing education course. The course was developed jointly by the AIA and the U.S. Architectural and Transportation Barriers Compliance Board, or Access Board. It covers new provisions in the ADA Accessibility Guidelines (ADAAG), which were developed by the Access Board. The course does not cover all of ADAAG. It is limited to two new sections covering state and local government facilities and building elements designed for children's use.

Please note that as of the time of course publication, the guidelines have not yet been adopted by the Department of Justice as ADA standards, although that process is underway. The facilities covered in these sections are required to be fully accessible under current regulations. The new supplements are guidelines on how to provide that accessibility.

Instructions

This Course Supplement provides additional information and case studies that will reinforce the information you learn in the online course.

To get the most benefit from the course, complete the online Introduction and your selected module(s) first, then read the corresponding section in this Course Supplement. Much of the information in the Supplement relates to ADAAG Section 4, which covers buildings in general. You should have a good understanding of the requirements in this section because it is frequently referenced in Sections 11 and 12, which the online course covers. If you run across unfamiliar terminology, refer to the Glossary in this Supplement.

Contents

Additional Background on the ADA and ADAAG

The Americans with Disabilities Act (ADA) of 1990 recognizes and protects the civil rights of people with disabilities. The ADA covers a wide range of disability, from physical conditions that affect mobility, stamina, sight, hearing, and speech to conditions such as emotional illness and learning disorders. The ADA regulations address access to the workplace (title I), state and local government services (title II) and places of accommodation and commercial facilities (title III). It also requires telephone companies to provide telecommunications relay services for people who have hearing or speech impairments (title IV) and provide miscellaneous instructions to Federal agencies that enforce the law (title V). Each of these five titles has a separate implementing regulation.

Regulations that set requirements and establish enforcement procedures are necessary to implement laws such as the ADA. Comprehensive regulations for titles II and III issued by the Department of Justice (DOJ) and the Department of Transportation (DOT) include enforceable standards for the construction and alteration of buildings and facilities. These standards, which are based on the ADA Accessibility Guidelines (ADAAG), are enforced by DOJ, DOT, and the courts and apply nationwide. It is important that the regulations be used *along with* the design standards they contain or reference. Although ADAAG compliance is not generally reviewed during the permitting process for new construction or alterations, its application is not unlike that of a state or local building code.

ADAAG derives from an earlier Federal standard, the Uniform Federal Accessibility Standards (UFAS). The format and technical criteria of both stem from private sector voluntary standards first developed by the American National Standards Institute (ANSI) in 1961. ADAAG provides both scoping and technical requirements. Information in the Appendix is advisory (non-mandatory) and noted by an asterisk (*). In general, specific provisions take precedence over general requirements and words and text over figures. Furnishings and equipment not fixed to building construction are not scoped or specified in ADAAG but may be covered by other provisions in the DOT or DOJ regulations.

Like most Federal regulations, ADAAG was developed under a rule-making process that invites public comment through publication in the Federal Register. Changes and additions to ADAAG are also published through the same rulemaking process that provides public notice and the chance to comment. Several additional guidelines and revisions have been made to ADAAG since its initial publication in 1991; the modules in this course cover some of them:

State and Local Government Facilities. Changes and additions to ADAAG covering state and local government facilities were proposed in December 1992 and June 1994. Final minimum guidelines were published by the Board in January 1998. These guidelines include new chapters on judicial, regulatory and legislative facilities (section 11), detention and correctional facilities (section 12), and miscellaneous changes to existing provisions. They will eventually become part of DOJ's enforceable standard.

Children's Environments. In January 1998 the Access Board published final guidelines for building elements designed for use by children. These guidelines provide optional design criteria based on children's dimensions. (As originally published, ADAAG requirements were based only on adult dimensions). DOJ intends to incorporate these new guidelines into its enforceable standard.

Other changes to ADAAG are underway, including:

- Recreation facilities
- Play facilities
- Outdoor facilities
- Sidewalks

ADA Information Sources

U.S. Architectural and Transportation Barriers Compliance Board (Access Board)
800-872-2253
TTY: 800-993-2822
www.access-board.gov
The Access Board provides additional guidance on, and copies of, ADAAG and UFAS. Toll-free technical assistance is available weekdays from 10:00 to 5:30 (EDT). All Board publications, including ADAAG, are available on the Board's web site.

U.S. Department of Justice
800-514-0301
TTY: 800-514-0383
www.usdoj.gov/crt/ada/publicat.htm
The DOJ regulates and enforces requirements for state and local governments and the private sector under titles II and III of the ADA and provides technical assistance on the regulations it has issued under these titles.

U.S. Department of Transportation
800-446-4511
TTY: 202-366-0153
www.dot.gov
The DOT regulates and enforces requirements for transportation access under titles II and III of the ADA.

Disability and Business Technical Assistance Centers
800-949-4232 (voice or TTY)
www.adata.org/text-dbtac.html
ADA information and assistance is also available closer to home through ten regional technical assistance centers established under a Federal grant. These centers can provide ADA information available from most of the Federal agencies listed above, as well as state and local information, training, and other services. The toll-free number connects you to the center serving your area.

Judicial, Legislative and Regulatory Facilities

New Accessibility Guidelines to Impact Courthouses

by Michael J. Crosbie, PhD, Associate, Research and Publications
Steven Winter Associates, Norwalk, CT

Two new amendments to the 1991 Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) have been issued. One set of amendments provides architects with more specific design guidelines for certain state and local government ("Title II") facilities, Section 11 judicial, legislative, and regulatory facilities, and Section 12 detention and correctional facilities. A second set of amendments focuses on building elements designed for children's use.

Called Final Rules, these two new guidelines are presently under review by the U.S. Department of Justice for adoption as standards under the ADA. Until the time that they become enforceable standards, these guidelines are not to be construed as imposing additional requirements on entities covered by the ADA. They do provide additional guidance for designers of such facilities on how to achieve the accessibility that is already required. Architects who design these facility types will find valuable information on how to comply with current obligations.

As part of a new program with the Access Board (an independent federal agency responsible for the development of accessibility guidelines under the ADA and other laws), the AIA will be developing education and training on these new guidelines in the future. The ADA currently covers courthouses, and architects are required to design accessible courthouses now. What is provided in the new guidelines is more definition, not new coverage. Courthouses have their own distinct design features. There are few settings in the built environment where accessibility—in both a literal and symbolic sense—is as important, as the U.S. Constitution provides for equal access to the law. So when architects use the new provisions, they will have more confidence that they are in fact designing accessible, usable facilities.

Of all the areas within the courtroom requiring accessibility, the most critical areas are the jury box, the witness stand, and the judge's bench. The jury box is normally surrounded by a low partition and has elevated or tiered seating. The best design solutions provide vertical access and turning space, allowing for a change in floor height without disrupting the relationship of the jury box to other functional areas in the courtroom. The same is true for witness stands, as they occupy a prominent, elevated position in the courtroom. However, the guidelines permit access to the judge's bench to be *adaptable*, so that accessible elements can be added when the need arises. An assistive listening system to aid in achieving effective communications for people who are hard of hearing is also a critical component of successful courtroom design.

The overriding goal for architects is to incorporate accessibility seamlessly into their projects to allow full access to the built environment by everyone without restriction. The challenge to provide courtroom accessibility, and to do it in ways that are sensitive to the decorum of the space and preserve its architectural character and traditional formality, is verified by architects who specialize in such design.

"I can't think of another building type where it is more important to provide a sophisticated solution to accessibility," says Marlene Walli Shade, AIA, of Phillips Swager Associates (PSA), a Washington, D.C. area firm specializing in judicial facilities. “Courtrooms are places where life and death issues are decided," she notes, “and the accessible solution should be discreet.”

Jim Beight, AIA, also of PSA, says that in the courtroom, accessibility plays a symbolic role every bit as important as its functional role. "The image you need to portray is that the judicial system is accessible to everyone—equal access to equal justice."

Both these architects say ramps are the preferable solution for access to jury boxes and witness stands, because they can be better integrated into courtroom design. While the Access Board notes that platform lifts are often the most expedient measure used to provide vertical access, mechanical solutions such as lifts can be a visual and auditory distraction, and they are prone to malfunction. For these reasons, note the architects, ramps are often preferred.

Jury box seating is usually six to eight inches above the courtroom floor. It may be necessary to reduce the height of the jury box and witness stand so that an appropriately sloped ramp can accommodate the vertical rise in less space. Limiting the height to five inches allows a shorter ramp run, where handrails may not be required, while still providing appropriate stature for the jury and witness boxes.

The judge’s bench is normally the highest element in any courtroom—usually 16 to 20 inches above the floor—so providing accessibility via a ramp is more of a challenge. Platform lifts are often the answer here. Mr. Beight notes that he has successfully designed ramped benches only 12 inches above the floor. An elegant solution that discreetly conceals the ramp from the courtroom space is to place it in a hallway behind the courtroom wall where the bench is located; the judge can then enter, as is customary, through a doorway behind the bench that is on the same level as the accessible route.

A copy of each of the new Final Rules can be obtained from the Access Board’s web site:

- **http://www.access-board.gov/rules/title2.htm** to download the document *State and Local Government Facilities Final Rule* which addresses judicial, legislative, regulatory, detention, and correctional facilities
- **http://www.access-board.gov/rules/child.htm** to download the document *Building Elements Designed for Children’s Use Final Rule*

To request a print copy of either document, or to obtain further information on the new guidelines or other accessibility issues, call the Access Board’s toll-free technical assistance line, 800-872-2253 (V) or 800-993-2822 (TTY). Technical assistance can also be reached by dialing 202-272-5434 (V) or 202-272-5449 (TTY).

Architects can also fax questions and drawings to the Access Board at 202-272-5447 or via email TA@access-board.gov.

Accessible Sites, Entrances, and Other Circulation Elements

Facility: Decatur County Courthouse
150 Courthouse Square
Greensburg, IN 47240

Designer: Schmidt Associates, Inc.
320 East Vermont Street
Indianapolis, IN 46204
317-263-6226

Originally built in 1860, the historic Decatur County Courthouse was renovated and expanded in 1995. The new addition of brick and limestone reflects the historic character of the courthouse as originally designed and is connected to the original building in such a way that almost all of the existing building remains unchanged.

The new addition features a curved public access ramp leading up to the main entrance of the courthouse. Before renovation, steps provided the only access. Relocating the new main entrance also reduced travel distance from the parking lot.

Each courtroom in the new addition features ramp access to the jury box and witness stand. A counsel room, located adjacent to a large meeting room, also features a ramp between the two spaces.

Each public counter includes knee room and maneuvering space designed to provide maximum accessibility while maintaining the contextual flavor of the furnishings and architectural elements.

The original historic door handles required upgrading. Doorknobs and hardware were replaced with push-pulls and appropriately-levered doorknobs to provide access on every floor.

Accessible Sites, Entrances, and Other Circulation Elements

Facility: New Queens Civil Court
89-17 Sutphin Blvd.
Jamaica, NY

Designers: Perkins Eastman Architects, P.C.
115 Fifth Avenue
New York, NY 10003-1004
212-353-7200

Smith Meeker Engineering
150 Warren Street, Suite 108
Jersey City, NJ 07302
201-332-9377

The New Queens Civil Court conforms to or exceeds ADA requirements for accessibility. Several of the features highlighted below are shared by all or most of the courtrooms.

At the main entrance, unusually wide curb cuts slope from the street to the sidewalk. The plaza is expansive and well lit, with entry at grade level. Accessible balanced entry doors have lever handles and floor closers. These doors open onto the same-grade foyer floor, with easy access to the elevator lobby.

Bright lighting illuminates each courtroom. Accessible ramps lead to witness and jury boxes, the law clerk's desk, and the judge's bench. Spectator benches are designed with hinged seats and end pieces that swing away for wheelchair seating. The back of the courtroom is raised 6 inches so that the judge, law clerks and jury can enter at a raised elevation.

Wide aisles provide easy maneuverability in the Calendar Court. Clearance between front rail and spectator benches is designed to accommodate wheelchairs at the front of the spectator seating area. Ramps provide access to the judge's bench, witness stand, law clerk's desk and jury box, as well as to the rear of the courtroom.

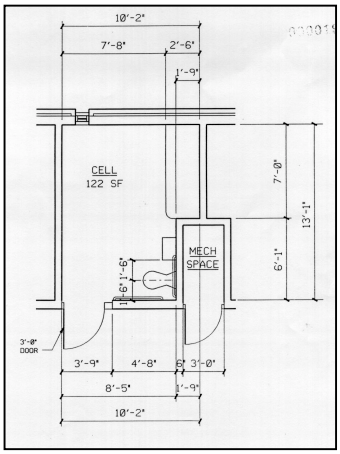
Accessible Sites, Entrances, and Other Circulation Elements

Facility: Denton County Courts Building
Denton County, Texas
1450 E. McKinney
Denton, TX 76201

Designer: Phillips Swager Associates
3622 North Knoxville
Peoria, IL 61603
309-688-9511

The Denton Country Courts Building, completed in 1998, was designed for full accessibility. For example, the primary public entrance is at grade level to accommodate wheelchair access. Entrance is through swinging doors directed to the security checkpoint, while exit is through power assisted, no-return, revolving doors. These doors are large enough for wheelchair access. Other than the courtrooms, the District and County Court Clerk's offices are the main county departments that require public access. Each department contains accessible transaction counters facing the main lobby.

For increased visibility the judge's bench, witness box and jury box are raised above the level of the gallery. The jury box is raised two tiers. The lower level of the jury box, raised 4 inches, is ramp accessible and includes a removable chair with adequate space for a wheelchair turnaround. The witness box is also ramp accessible to its 4-inch height. The judge's bench is raised 21 inches and is accessed from the secure staff side of the facility. At the time of construction, only one wheelchair lift to a judge's bench was built. However, space and power was provided at all other courtrooms for future installation of lifts as needed.



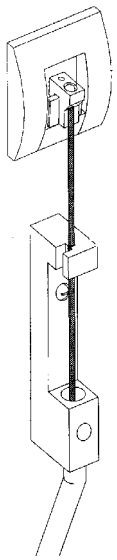
Each pair of courtrooms is adjacent to three prisoner holding cells for prisoners awaiting court appearance. One of each of the three cells is accessible. This plan shows one design. The holding cells are reached via a secure elevator from the main holding area in the basement. The main holding area contains accessible cells and other accessible prisoner areas.

Accessible Elements - Fire Alarm Pull

Southeast Disability & Business Technical Assistance Center (SE DBTAC)
Center for Rehabilitation Technology (CRT)
School of Architecture
Georgia Tech University
Atlanta, GA

The Americans with Disabilities Act (ADA) of 1990 states that reach ranges to operate items from a side approach may not exceed 54". (Sec. 4.2.5 and 4.2.6). Conventional fire alarm systems installed in many state and local government facilities do not meet the ADA height requirements and therefore deny access to people with disabilities.

Moving an alarm pull switch to accommodate the height requirements may require longer fire alarm wires. However, municipal fire and electrical codes prohibit splicing fire alarm wires. Accordingly, a fresh run of wire from the switch to the main fire alarm console is required in order to move a switch further from the console. Such a process can use miles of wire in large state and local government facilities. In addition to the cost of wire, there is a significant labor cost.



In order to address this issue, CRT designed a fire alarm pull extension. (The pull was designed by CRT and licensed to Mitec Controls, Inc., 3040 F. Business Park Drive, Norcross, GA 30071, 770-662-0094). The extension effectively moves the location of the switch by moving the point of actuation without having to relocate the switch. The extension was designed for actuation using gross motor movements only. This allows for operation by people who may have limited grip strength.

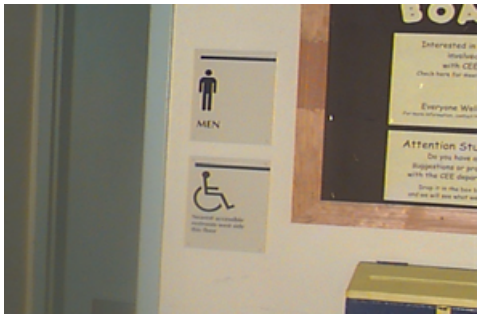
The weight of a hand in the extension hook will activate the fire alarm; there is no need to grasp the pull, as is necessary on a standard fire alarm.

Accessible Elements – Restroom Signage

Southeast Disability & Business Technical Assistance Center (SE DBTAC)
Center for Rehabilitation Technology (CRT)
School of Architecture
Georgia Tech University
Atlanta, GA

Accessible restroom facilities are not always feasible in retrofit situations. While it may not be possible to modify every facility, the goal of each project should be to provide a minimum of one accessible restroom facility on each floor of each building preferably one accessible facility per sex per floor.

When facilities are not accessible, information should be provided to indicate the location of facilities that are accessible. Appropriate signage is necessary. Such signage is considered directional, and must be easily read. No Braille or raised characters are required, although access symbols may be required on some directional signs. Characters should be sized for the viewing distance and proportional in size, as very thick or thin characters can be hard to read. All signs must have a non-glare finish as well.



The sign in the photo to the left reads "Nearest accessible restroom west side this floor." Other signs may use arrows rather than words as directions.

The photo to the right shows a sign indicating an accessible unisex restroom. This is a room designation sign rather than a directional sign, and requires raised characters, Braille, and symbols.

Accessible Elements – Ramps

Southeast Disability & Business Technical Assistance Center (SE DBTAC)
Center for Rehabilitation Technology (CRT)
School of Architecture
Georgia Tech University
Atlanta, GA

Ramps can be installed as a solution to a variety of access barriers. Well-built ramps create access with limited requirements for maintenance. Unlike lifts, ramps are not electromechanical, so they are preferred in situations that lack power or on pathways that receive a great deal of traffic.

However, ramps do not work in all situations. Rise requirements can result in ramps that are too expensive or too long or too high to use. The ramps shown here are manageable in length, easily installed, cost effective, and used by people on foot, in wheelchairs, on bicycles, etc. Ramps should be designed to be used by all pedestrians, regardless of ability or need.

The ramp on the left connects two areas with significantly different levels. Designed to be functional as well as attractive, this ramp features a switchback configuration, continuous handrails with extensions (painted to blend into the surrounding landscape), and a curb to help prevent wheelchair rolloff.

The ramp on the right provides access to a building entrance that previously had only steps. Designed to blend with the building, the ramp is constructed of concrete and brick the same color as that of the building. The brick provides a natural lip at the edge of the ramp, and handrails were installed to connect to the stair rails. A power door opener enhances access at the entrance.

The photo on the left shows a ramp connecting to a deck that serves a restaurant. Each of the two levels can be reached by using the connecting sidewalks and ramp, permitting people with mobility impairments to enjoy the same amenities as people without disabilities.

Detention and Correctional Facilities

Designing Detention and Correctional Facilities Under the New Accessibility Guidelines

by Michael J. Crosbie, PhD, Associate, Research and Publications
Steven Winter Associates, Norwalk, CT

Accessible detention and correctional facilities is the focus of one of two new amendments to the 1991 Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG). One set of amendments provides architects with design standards to meet accessibility requirements for environments designed specifically for use by children, and covers a wide range of equipment, furnishings, and building elements. A second set of amendments focuses on state and local government facilities, including judicial, legislative, and regulatory facilities, and detention and correctional facilities.

Called Final Rules, the new recommended guidelines are presently under review by the U.S. Department of Justice, and a date for their adoption as regulations has not yet been set. Until the time that they become regulations, these guidelines are advisory only, and are not to be construed as requirements. However, in anticipation of their adoption, architects who design these facility types should become familiar with these guidelines.

Section 12 of the new title II guidelines applies to jails, holding cells in police stations, prisons, juvenile detention centers, reformatories, and other institutional occupancies where occupants are under some degree of restraint or restriction for security reasons.

Architects familiar with the rulemaking process will note a change in the scoping provisions from the proposed rule published for public comment in 1992. The original Notice of Proposed Rulemaking suggested that accessible cells be provided at a minimum of 5% of the total number of cells in a facility, which was viewed as unnecessarily burdensome, particularly in existing facilities, where cells are harder to adapt. Section 12 sets the requirement at 2% of the total number of cells, but not less than one. Commentary in the Preamble cites data submitted by several correctional agencies putting the percentage of inmates with disabilities housed in jails in Nebraska and Texas at .07% and .48%, respectively. New York City reported that .25% of its inmate population uses wheelchairs. According to James Kessler, AIA, senior principal and director of criminal justice facilities for Hellmuth, Obata + Kassabaum's Washington, DC office, the 2% requirement seems more in line with real life experience of the number of inmates that may require an accessible cell.

The new rule also differs from its proposed version in that it does not stipulate how accessible cells should be dispersed throughout a facility. Allowing prison administrators and architects discretion in distributing accessible cells, according to commentary in the new rule, permits facilities to be more responsive to the particular needs of its prison population and its programs. Kessler makes the point that the ability to locate accessible cells in certain areas also has a big impact on the need to make other areas, such as day rooms, accessible or not.

Locating accessible cells on the first floor of a day room with a mezzanine, for example, means that the mezzanine need not be made accessible and that elevators and staircases need not be designed to ADAAG standards as long as accessible cells and all public and common use spaces serving them are on an accessible route.

Grab bars are not required in accessible cells that are used exclusively for suicide prevention. Such cells are specifically designed without projections. Kessler notes that accessible cells are usually designed to be slightly wider than typical cells in order to provide wider doors and more clearance room. This usually necessitates the separation of the sink and the toilet in "wet" cells. However, there are combination sink and toilet units that meet ADAAG requirements.

Kessler notes that, based on his experience with general ADAAG requirements, "the new rules are excellent." He notes that such requirements "make us a much more caring society. At the beginning they seemed excessive and expensive, but as one becomes acclimated and understands the standards, they are not that difficult to incorporate. They are now part of our standard details and specifications."

To obtain a copy of the guideline from the Access Board's web site:

- **http://www.access-board.gov/rules/title2.htm** to download the document *State and Local Government Facilities Final Rule*, which addresses judicial, legislative, regulatory, detention, and correctional facilities.

- **http://www.access-board.gov/rules/child.htm** to download document *S-30, Building Elements Designed for Children's Use Final Rule.*

To request a print copy of either document, or to obtain further information on the new guidelines or other accessibility issues, call the Access Board’s toll-free technical assistance line, 800-872-2253 (V) or 800-993-2822 (TTY). Technical assistance lcan also be reached by dialing 202-272-5434 (V) or 202-272-5449 (TTY).

Architects can also fax questions and drawings to the Access Board at 202-272-5447 or via email TA@access-board.gov.

Circulation Elements and Accessible Cells

Facility: Mecklenburg County Intake and Detention Center
Mecklenburg County Sheriff's Department
725 East Trade St. Suite 200
Charlotte, NC

Designer: Hellmuth, Obata + Kassabaum, P.C.
3223 Grace Street, NW
Washington, DC 20007
202-339-8805
910-790-9901

Mecklenburg Detention Center, designed by HOK in joint venture with Little Architects, integrates the program requirements of a single-cell, direct supervision facility within the constraints of a prominent downtown government complex. Phase I, consisting of 1,004 secure beds, was completed in December 1996 with a 900-bed expansion planned to follow. The housing pods are organized horizontally around a circulation spine and vertically by the stacking of cells and day rooms. Arrest processing, public reception, administrative and medical treatment areas occupy the lower three floors.

Direct supervision and the extensive use of dry cell pods fosters a normalized environment and saves money in construction and equipment costs. In these areas, inmates have keys to their own cells and are allowed free access to the dayroom and toilet facilities, enabling them to retain some privacy and personal territory. There is at least one accessible cell per pod. All dayrooms serving accessible cells are accessible.

An open plan processing area with color-coded, airport-style seating zones encourages a more relaxed atmosphere for officers and arrestees. The planning allows flexibility of movement, custody and staffing to adapt to variable intake loads and to alleviate bottlenecks.

Circulation Elements and Accessible Cells

Facility: Johnson County Adult Detention Center
27745 West 159th Street
New Century, KS 66031

Designer: Rafael Architects
106 West 11th Street, Suite 2110
Kansas City, MO 64105
816-842-7826

Completed in June, 1999, the Johnson County Adult Detention Center is master planned for incremental growth for each facility in the complex: the Operations Center, Adult Detention Center, and Community Corrections Facility.

Circulation throughout the facility is designed for efficiency and separation of visitors from staff and inmates. The main entry is below primary housing, separating inmate and staff circulation. Because visitors using wheelchairs cannot pass through the fixed security screening device, an accessible alternate route is provided next to the device (to the left, as shown in the photo). As required, this route is direct and convenient so it is equivalent to routes used by others.

The 264-bed, medium security jail is divided into five secure zones. Each contains an upper-level control post for direct supervision with a fully integrated monitoring and communication system. At least one accessible cell is provided for each general population housing unit, in addition to a 96-bed dormitory. Medical units are also equipped with accessible elements.

Building Elements Designed for Children's Use

Designing for Children Under the New Accessibility Guidelines

by Michael J. Crosbie, PhD, Associate, Research and Publications
Steven Winter Associates, Norwalk, CT

Accessible environments designed and built for children is the focus of one of two new amendments to the 1991 Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG). One set of amendments focuses on environments designed specifically for use by children, and covers a wide range of equipment, furnishings, and building elements. Another set of amendments provides architects with design standards to meet accessibility requirements for state and local government facilities, including judicial, legislative, and regulatory facilities, and detention and correctional facilities.

Called Final Rules, these two new guidelines are presently under review by the U.S. Department of Justice, and a date for their adoption as standards has not yet been set. Until the time that they become enforceable standards, these guidelines are not to be construed as imposing requirements on entities covered by the ADA. However, in anticipation of their adoption, architects who design these facility types should become familiar with these guidelines.

Children's environments considered by the guidelines can be virtually any type of facility--not just schools, libraries, or day-care centers--but any space or element inside or outside a building that may be designed for a child. This article highlights the new guidelines and also discusses the necessity for accessible environments for young people. Such accessible environments communicate to children – at an early and impressionable age in their lives – that disabled people can share equally in the use of architecture if it is properly designed and constructed.

The amendments provide alternate specifications based on children's dimensions for elements covered by ADAAG including drinking fountains, water closets, toilet stalls, lavatories and sinks, and fixed or built-in seating and tables. When first published in 1991, ADAAG provided specifications based only on adult dimensions. The new amendments permit departures from existing specifications where a building element is designed for use by children instead of adults. The guideline also notes distinctions within this user group, with advisory information that recognizes the differences in size, stature, and reach ranges of children ages 3 through 12.

For example, the new amendment contains valuable guidance on reach ranges across three separate age groups. Three to 4-year-olds have a forward or side reach range of 20 to 36 inches, 5 to 8 -year-olds have a range of 18 to 40 inches, and 9 to 12-year-olds have a range of 16 to 44 inches. The guideline contains similarly detailed information on these three age groups regarding water closet center lines from a side wall, and heights for toilet seats, grab bars, and tissue dispensers.

According to Sarah Woodhead, AIA, an architect who specializes in the area of design for children with disabilities, the issue of reach range by age group is an important one, not only because kids come in all shapes, sizes, and disabilities, but also because children continually learn to maneuver as their bodies grow. "Children are still developing their gross motor abilities," says Woodhead, "and still learning to manipulate their world."

Woodhead points out that the "seamless" approach to universal design--integrating accessible features as part of the overall design, is the best one to take. School auditorium stages, for instance, might incorporate an access ramp as part of the stair, or gently sloping wings that rise to stage height. "That's an elegant solution that enhances the performance options of the auditorium," she notes.

The fact that the guidelines include a variety of architectural elements points to the necessity, according to Woodhead, for children's environments to offer "comprehensive" access, not just entry into the building, but in every aspect of the building's use on par with its facilities for the able bodied. For example, notes Woodhead, a common deficit in the design of school science labs is the provision of an accessible lab bench, with lower counter heights and clearance, which is located against a wall away from the other benches. This not only ignores the fact that students often work in teams on such projects, and that the accessible bench cannot be used by more than one student at a time, but it also stigmatizes the user by placing them away from other students, where collaborative learning might take place. Architects need to provide access sensitively.

To obtain a copy of the guideline from the Access Board's web site: http://www.access-board.gov/rules/child.htm to download document Building Elements Designed for Children's Use Final Rule.

To request a print copy of either document, or to obtain further information on the new guidelines or other accessibility issues, call the Access Board’s toll-free technical assistance line, 800-872-2253 (V) or 800-993-2822 (TTY). Technical assistance can also be reached by dialing 202-272-5434 (V) or 202-272-5449 (TTY).

Architects can also fax questions and drawings to the Access Board at 202-272-5447 or via email TA@access-board.gov.

Designing for All Children

by Vicki Stoecklin

Children need age and developmentally-appropriate physical environments that support, promote and include child-directed and child-initiated play and learning. Active, creative play and exploration is central to normal child development. The physical environment can either contribute to children's development and support learning and exploration, or become a permanent impediment. The design and layout of the physical environment, which includes the building, interior finishes, outdoor spaces, room arrangement and selection of equipment, has a profound impact on children's behavior.

The concept of designing for all children is based on the tenets of child development, which recognizes that each child is unique and passes through a series of recognizable stages of development. These stages are different for each child, including children with disabilities. The underlying definition of design for all children is similar in context to the definition of universal design. Designing for all children means creating environments that can be used by all children without adaptation. It also means that the environments are free from both physical and social barriers. The following list of key elements can be used by designers, architects and early childhood staff to create functional environments that are inviting to every child.

Equitable Use

The intent of all state and Federal legislation for children with disabilities is to provide a minimum level of access. This does not mean segregating and stigmatizing any user – able-bodied or disabled. Designing for equitable use may mean going beyond minimum requirements to create a design that functions for a wide variety of users and allows children to socialize. For example, in designing a water play element for children, our company chose to create a universal design of multi-height tables that would allow an undertable or side approach by wheelchairs of various heights, walkers of various sizes, and standing children of various heights. Children could then self-select the height and design of the table that worked best for them. This design solution encouraged socialization among children who used the table – non-disabled children of various sizes as well as those using wheelchairs or walkers. A far less equitable approach would have been to label each side of the table by chronological age of the intended users and designate areas for wheelchair and/or walker access.

Equitable use means creating a design that works for all types of users and does not exclude any intended users. Young children of all stages of development and older children with delayed motor development may not be able to adapt to inappropriate design. Inappropriate access can lead to situations in which no child can use equipment without adult assistance. This same principle can be applied to creating appropriate sinks and toilets for all children. These facilities must work for the non-disabled child as well as the child with disabilities.

If sinks and toilets are too high they may be unreachable. If they are too low they may create safety problems, especially for very young or cognitively impaired children who might climb into them. Equitable design suggests providing children's elements at a range of heights.

Consider an elevated sandbox or sand table. Sand serves as a sensory experience for children of all ages, abilities and development, so sand play is often best executed with the child immersed in the sand. An elevated sand table may defeat this purpose. In addition, there is no single height at which the sand table would meet the needs of all children. A traditional sandbox is a more equitable design solution. It can be equipped with a transfer station for children using wheelchairs, and/or an adapted stair for children using walkers or those with limited sight or underdeveloped motor abilities. With this design, all children have the sensory experience of immersed sand play.

Designing for all children means creating spaces that are free from social barriers. Both indoor and outdoor spaces must allow for positive interpersonal interaction and socialization among children of different abilities and of both genders. Spaces must be available for small groups, solitude, quiet play, large groups and active play. Appropriate space will create opportunities for developing self-confidence and social skills.

Flexibility and Independence

Environments should foster a child's independence. A developmental task of childhood is to move from total dependence on adults to a more mature independent stage. Independence can best be achieved by creating environments that can be used by children with a wide range of individual preferences and abilities. When designing an interactive cooking station, our company created a design of multi-height movable counter tops and multi-height stools that could be adjusted to meet the diverse needs of a group of children including those with disabilities.

Both children and adults often learn to adapt to poor design. For example, in one children's facility, a piece of outdoor playground equipment had been adapted for children with disabilities. A transfer deck was provided for children using wheelchairs. This program did not have any children enrolled who used wheelchairs, but it had a high number of children who used a variety of walkers. Consequently, to use this adapted equipment, teachers were forced to take children out of their walkers and carry them up the stairs. Not only does this type of poor design foster dependence on the child's part but it creates a very unsafe situation for both teachers and children. Our company remedied the situation by creating a master plan for the complete renovation of this outdoor play space. In addition to the transfer stations, we added a series of steps and ramps that could be used by children in either walkers or wheelchairs.

Designing for all children means understanding that children come in a variety of sizes that are not always directly related to chronological age. Many children with disabilities do not follow typical growth patterns. Our team makes use of a variety of anthropometric charts, which are then adjusted based on the children's motor abilities and how the design will be used.

Safety

Designers must follow mandatory and voluntary safety guidelines that apply to both children and staff. The design must support active but *safe* experimentation and risk-taking. The physical environment and equipment must be arranged to minimize hazards and errors. It must also support the role of staff and parents in assisting in the play and learning environment.

The design of outdoor playground equipment is tightly regulated and controlled by several safety guidelines; however, there are no standards for similar types of equipment and design used indoors. Dangers (both inside and outside) include inadequate or missing shock-absorbing fall zones, which could prove lethal to a child; designs that encourage inappropriate behaviors, toxic materials and plants; and strangulation and body entrapment hazards.

A Team Effort

The process of envisioning and designing environments that support competence, independence, exploration and inclusion is far more complex than following a list of suggested guidelines. The product can only be as good as the process that creates it and the expertise of the design participants.

Designing for all children requires a multi-disciplinary, cross-functional design team from the beginning. The team should meet in a concurrent format where experts who design the facility and those who operate it create the design program, goals and requirements together. Program goals, building use, children's needs, staff needs and parental needs drive the concurrent design process. Other issues that need to be examined up front in the process are furniture, equipment and operating costs prior to designing the physical space.

The design team needs to be structured and sensitive to staff, parental and community input. The team should have members with specialized expertise in early childhood education, special education, child development, children's environmental design, architecture, landscape architecture, interior design, horticulture, acoustics for children, equipment selection, universal design for children, and cultural competency. A team can bring the added benefits of a broad view and collaborative creativity.

In summary, designing for all children asks us to more closely examine our values and beliefs and to learn to collaborate with others in different areas of expertise. Designing for all children finds a way to support and encourage each child's abilities, similarities, and uniqueness.

Vicki L. Stoecklin is the Education and Child Development Director with White Hutchinson Leisure & Learning Group, a Kansas City, Missouri firm specializing in design and consulting for children's environments, including children's museums, children's leisure and entertainment sites, schools, child care facilities and natural outdoor environments. Vicki has a Master's degree and twenty-three years experience studying and working with children, including children with disabilities. She can be reached at voice: 816-931-1040, fax 816-0756-5058, Missouri relay (TTY) 800-735-2966 and e-mail: vicki@whitehutchinson.com.

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Accessible Sites, Entrances, and Other Circulation Elements

Facility: Perquimans Central Elementary School
Windfall, NC

Designer: Boney Architects
2528 Independence Boulevard
Suite 200
Wilmington, NC 28412
910-790-9901

Perquimans Central Elementary School in Windfall, NC serves 550 children. Access to all parts of the building, both exterior and interior, meet current ADA regulations. All entrances are accessible from bus, faculty, and visitor parking areas via curb cuts and sidewalks. The main entrance is fully accessible by wheelchair. A covered entrance prevents ponding water at doorways during heavy rains.

In addition to classrooms, a cafeteria, and other rooms common to elementary schools, Perquimans School includes a multipurpose room and stage.

The room is expanded by folding a partition back from the cafeteria. A ramp provides access to an elevated stage. Double handrails are provided at adult and children's heights.

Accessible Sites, Entrances, and Other Circulation Elements

Facility: Tremont Elementary School
Dixon Unified School District
355 Pheasant Run Drive
Dixon, California 95620

Designer: Ward-Wolstenholm, Architects, AIA
1430 Alhambra Boulevard, Suite 200
Sacramento, CA 95816-9052
916-452-7423

Tremont Elementary School in Dixon, CA, was completed in 1997. A number of enrolled students have mobility disabilities. Classrooms are portable and arranged to create an open-air courtyard for assemblies. Subfloor venting at the sidewalk level allows for at-grade classroom entrances, unusual in standard portable buildings, where ramps are typically used.

The school is equipped with an outdoor amphitheater located in front of a multipurpose building. Ramp access to the performance platform is shielded by a planter. The performance platform is also accessible by stairs.

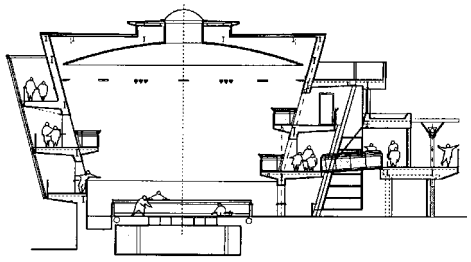
The performance pit for the amphitheater is constructed with both stair and ramp access as well.

Accessible Sites, Entrances, and Other Circulation Elements

Facility: Yerba Buena Gardens Rooftop
San Francisco Redevelopment Agency
221 Fourth Street
San Francisco, CA 94103

Designer: Adele Naude Santos & Associates
33 Zoe Street
San Francisco, CA 94107
415-908-3767

Located on the top of the existing Moscone Convention Center in downtown San Francisco, this 100,000 square foot complex includes a carousel, an ice skating center, a bowling alley, a Child Development Center and the Zeum, a multi-media museum for children 8-18. Notable access issues addressed in the project are the connection of the overall project to the surrounding context, the circulation system in Zeum, and the development of casework in the Child Development Center.



Zeum

In Zeum, children participate in making art using both traditional and digital techniques. A spiral ramp links the three levels of the facility, creating an orientation point for visitors. (see cross-section to left)

The reception desk has a section that allows for wheelchair approach Windows and video monitors allow views into other spaces of the facility while moving up the ramp. Kick base cabinets open to allow wheelchair access to the sink.

Child Development Center

The Child Development Center accommodates about 100 students. Entrances to all classrooms are accessible. A lowered ceiling provides a quiet retreat within the classroom without requiring a change in floor level.

Lofts in the preschool rooms have open undersides to provide equivalent access for children who are unable to climb to the upper level.

Counters are designed at a height of 34" as required for adult accessibility, while standard height refrigerators were accommodated in full height cabinetry.

Accessible Sites, Entrances, and Other Circulation Elements

Facility: Tenderloin Community School
San Francisco Unified School District
650 Turk Street
San Francisco, CA 94102

Designer: Esherick Homsey Dodge & Davis (EHDD)
500 Treat Avenue
San Francisco, CA 94110
415-285-9193

In 1998, San Francisco's low-income Tenderloin District opened a multiuse facility that not only serves as an elementary school, but also includes adult services such as counseling and dental and medical care. The school was designed to support the sense of community with an open-door, welcoming feeling. Access was incorporated as part of the design.

The gently sloping ramp and handrail make it possible for people with mobility problems to access a full range of school facilities.

The building is constructed with wide hallways and adequate space for wheelchair movement and turnaround. The wide hallways are also free of protruding obstructions that can be hazardous to people with vision impairments.

Furniture and Play Areas for Children with Special Needs

Facility: Sierra Nueva High School
San Juan School District
1400 Bell street
Sacramento, CA 95825

Designer: Ward-Wolstenholm, Architects, AIA
1430 Alhambra Boulevard, Suite 200
Sacramento, CA 95816-9052
916-452-7423

About two hundred students attend Sierra Nueva High School, which was established to provide pregnant and parenting teenagers with a chance to continue their education in a supportive environment.

The school was relocated in August 1997 into portable classrooms. In a similar situation to Tremont Elementary School, Sierra Nueva High School in Sacramento consists of portable buildings arranged to create an open-air assembly courtyard. Subfloor venting at sidewalk level allows for accessible entrance into each classroom building.

Inside, furniture is also designed for children with disabilities. Note the wide seat and side arms to facilitate rising and sitting.

Furniture and Play Areas for Children with Special Needs

Facility: The Lighthouse, Inc.
111 East 59th Street
New York, NY 10022

Designer: Mitchell Giurgola Architects, LLP
170 West 97th Street
New York, NY 10025
212-663-4000

The Lighthouse headquarters in New York was built to serve a diverse population who represent every step along the continuum of vision impairment, from partial sight to blindness, as well as people with other physical impairments, people who use wheelchairs, and people with full sight. Comfort and ease of use for Lighthouse employees was also a key consideration in designing the new structure. The Lighthouse Center for Education develops programs that enhance the early development of children who are visually impaired.

An integrated wayfinding system includes large-print white on black signage; tactile signs identifying locations in raised letters and Braille, positioned at an angle to optimize readability; and "talking signs" that identify conference rooms, restrooms and stairways out loud to consumers carrying special hand-held receivers. The elevators feature a special enunciation system that identifies each floor and directs people toward the reception desks where floor-specific tactile maps are located.

Since loss of the ability to perceive color contrast is one of the most common effects of vision impairment, strong contrasting colors are used throughout the building and in indoor and outdoor play areas.

Assistive Listening Systems

Assistive Listening Systems Consumer Brochure

What are Assistive Listening Systems (ALSs)?

Assistive listening systems (ALSs) are devices designed to improve a hearing-impaired person's ability to hear in many listening situations. Typically, they are used in such large-area listening venues as movie houses, theatres, auditoriums, convention centers, stadiums, and houses of worship, though they may also be found in such smaller listening locations as courtrooms, museums, community centers, funeral parlors, etc. It is important to note that ALSs are not substitutes for hearing aids. They are, rather, intended to *supplement* the use of hearing aids and they can be used whether or not someone wears hearing aids.

How do they work?

Whenever speech sounds have to travel some distance from their source before arriving at a listener they will be weakened by distance, and distorted by background noise and reverberation, before they are received by the listener. The source can be "live-speech" (no microphone) or sounds emanating from loudspeakers. All types of ALSs have one principal in common: they all "bridge" the acoustical space between the source and the listener, thus reducing the effects of the intervening acoustical conditions upon speech perception. This "bridging" is accomplished by transmitting the sound signals to personal receivers via electromagnetic, radio, or infrared light waves rather than through the air.

When using an ALS, it is as if the listener has his or her ears right next to the loudspeaker or the talker's mouth. Of course, in the real-world this is hardly a very feasible practice! In effect, however, ALSs reduce the "mouth to ear" distance by transmitting the sounds from the source directly to the listener. This direct reception of the speech signals boosts their loudness relative to the background sounds (increasing the so-called speech-to-noise ratio, or S/N). Of all the factors that can be taken to improve speech comprehension, this increase in the speech-to-noise ratio is probably the most important one.

***Why are assistive listening systems necessary*?**

Poor acoustical conditions can have a disproportionate effect upon the ability of someone with a hearing loss to understand speech. By its nature, a hearing loss reduces the quantity and quality of acoustical information received through the ears. Even if what would be considered a favorable listening environment for people with normal hearing, hearing-impaired people may already be struggling to understand. By adding noise and reverberation to the listening equation, which acts to further reduce the quality of speech signals, a hard of hearing person's comprehension can fall from adequate to near zero. One cannot, in other words, judge the adequacy of an acoustical enclosure with normal ears.

Because ALSs by-pass the intervening acoustical conditions, their deleterious impact can be overcome. The remaining limits to a person's ability to understand speech, then, resides in the degree and nature of the hearing loss and not in the complications wrought by the external

acoustical conditions. What ALSs do for people with hearing loss is to permit them to function to the limits of their residual hearing capacities.

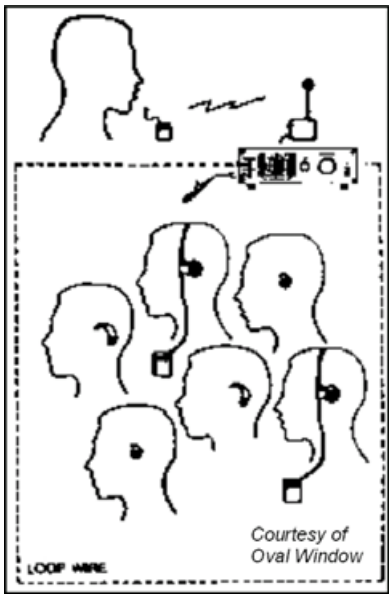
ALSs can do more, however, than just improve basic speech perception capabilities in a large-area listening situation. Often people with hearing loss are able to, with a great deal of effort, and by expending a great deal of energy, understand the spoken messages in such places. They do get it. But they have to focus so intently on *receiving* the spoken messages that they have difficulty attending to *what* is being said. Unlike people with perfectly normal hearing, they can't really relax and enjoy the experience. ALSs will help them to do this and preclude their leaving the venue tired and unhappy, something that happens all too often when people with hearing loss attend public events.

Who can they help?

ALSs can help any person with a hearing loss who is able to benefit from sound amplification. These listening systems clearly are not appropriate for deaf people who do not use or depend upon sound for communicative purposes. (We strongly recommend some sort of visual access - captioning or a sign language interpreter - for this group of people.) ALSs can also help some older people with normal or near-normal peripheral hearing thresholds, but whose central auditory processing abilities have diminished with age. Just like people with hearing loss, the speech perception capabilities of these people are often disproportionately affected by different kinds of distortions of the speech signal (noise, reverberation, foreign accents, poorly articulated or rapid speech, etc.). While far from a panacea, the increase in the speech-to-noise ratio provided by an ALS should also improve speech comprehension for this group of older people. We have even seen ALSs used by people with perfectly normal hearing whose seats would have prevented them from fully hearing the stage performance. After investing $75.00 or so for a theatre ticket, these people feel that the extra $2.00 charge to rent headphones is a good investment!

What types are there?

Basically there are three types of large area ALSs:

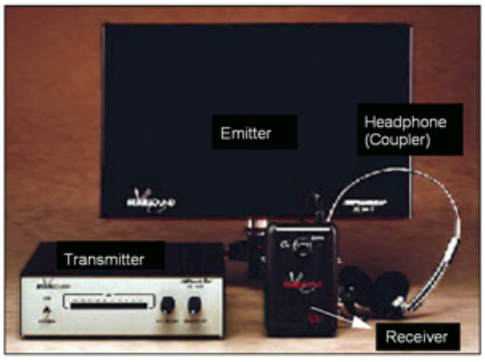


In the first type, the IL (induction loop) system, a loop of wire encircles the listening area (or is embedded in a mat placed under a rug). This loop of wire is connected to the amplifier of a Public Address (P.A.) system in addition to the loudspeaker. When the amplifier sends an electrical signal to the wire, an electromagnetic field is created around the wire. While it may be hard to conceptualize, this electromagnetic field actually contains the original acoustical information but in a different form (in the same way as electrical currents in telephone wires, for example, contain the originating speech information). These electromagnetic signals are accessed by listeners through the telephone coils found in many hearing aids (about 30% of hearing aids include "T" coils). When the electromagnetic field

intersects these coils, it produces an alternating electrical current in the coil (similar to the way a microphone produces an electrical current in response to sound stimulation). This electrical current is then processed by the hearing aid and converted back into audible sound. The major advantage of IL systems is that listeners whose hearing aids include "T" coils always have their special ALS "receiver" with them. All they have to do is turn their hearing aids to the telecoil position when entering the looped area and they are "tuned in". (In addition to the role of telecoils in fostering telephone communication, their function as an "assistive listening receiver" is another reason we strongly recommend that telecoils be included in hearing aids.)

Courtesy of Williams Sound

The second type is the FM system. An FM assistive listening system is simply a variation on the traditional FM radio. The signals are "broadcast" by FM transmitters and picked up by listeners using an "FM radio" tuned to the transmitting frequency. These "radios", or special FM receivers, are made available by the facilities that use FM ALSs. The FCC has reserved the non-commercial 72MHz to 75MHz and the 216 MHz to 217 MHz bands for auditory assistance devices. The lower band is a non-exclusive band, which means that interference from other users in the same frequencies may occur (such as from emergency vehicles of various kinds). There are several potential problems with FM systems. The first is that privacy is not possible. The FM signals do not stay contained within the four walls of the enclosure. If privacy is a consideration, then an FM system is not appropriate for that facility. The second potential problem is the flip-side of the first: radio signals originating outside of the facility can enter the facility and interfere with reception. One cannot prevent occasional interference, as when some emergency vehicle in the area transmits on the same frequency used in the venue. However, persistent interference can usually be overcome by selecting alternate frequencies within the permitted bands.



Courtesy of Phonic Ear

The third type of ALS is the Infrared (IR) light system. In an IR system, audio signals from any source are conveyed to listeners via infrared light waves (using Light Emitting Diodes) invisible to the human eye. The light waves are picked up a photo detector diode contained within the transparent lens found on every IR receiver. The receiver then extracts the original audio information from the IR signal and delivers an amplified version to the ears of a listener.

Ordinarily, strict "line of sight" is necessary between an IR emitter and the transparent lens on the receiver, but this can be modified in rooms with light-colored surfaces (the IR waves are reflected off them) or with more powerful transmitters. Since IR systems are light waves, they exhibit the advantages and disadvantages of light waves. The IR signals are contained within a room, thus ensuring privacy, and adjacent rooms in a facility can use IR systems without fear of inter-room interference. They are also not as subject to radio or electromagnetic interference as are FM

systems. However, there may be problems is using them outdoors because of the effect of sunlight (which contains a great deal of infrared energy) and it is more difficult to effectively cover the largest venue with an IR transmission than with a radio type system.

All IR systems require a radio-frequency (RF) sub-carrier as an intervening step between the audio and the light waves. That is, the audio signals first "modulate" the RF sub-carrier which in turn modulates the IR light signals. Until now, 95 kHz has been the unofficial RF sub-carrier, permitting a person to use the same IR receiver in different venues.

Compatibility between venues has always been a major advantage of IR systems. The situation may now be changing. Some facilities are currently using different frequency RF sub-carriers with their IR systems. This will not be a problem if a consumer uses the IR receiver supplied by a facility, since the IR transmitter and receivers will be "tuned" to one another. It may be a problem, if a person prefers to purchase an IR receiver for personal use (see below).

What kinds of facilities are required by the Americans with Disability Act (ADA) to provide ALSs?

ALSs must be provided in all places of public accommodation, defined as any private entity whose operations affect commerce. This would include places of entertainment and public gathering, such as movie houses, theatres, convention centers and lecture halls. It does not include purely private clubs or religious establishments. While not required, many houses of worship still make ALSs available because of concern for the welfare of their congregants. Large-area type listening situations are not the only types covered by the ADA.

An assistive listening system is required in any assembly of 50 or more seats in which audible communication is integral to the purpose of the location. Courtrooms are explicitly required to include ALSs regardless of the number of seats. The law also requires places of public display, such as museums that offer audible access (e.g. tours) to people with normal hearing, to provide ALSs to people with hearing loss. In brief, a good assumption is that an ALS should be available in any place of public assembly (unless it can be demonstrated that this would impose an undue burden on the management).

The law and reality, however, may not coincide. There are many movie houses, theatres, public auditoriums, etc. that do not provide ALSs and have no plans to install them. If there is no demand by consumers, then there will likely be no action by the venue. On the other hand, private businesses will respond to requests by consumers, if there are enough requests and they are made forcefully and repeatedly. Many facility managers complain that having made ALSs available, few consumers take advantage of their presence. So consumers, too, have an obligation – and that is to use (and enjoy) them on frequent occasions.

Are special receivers required?

All ALSs require special receivers. In the simplest case, when an IL system is being employed, this may simply be the telecoil in a personal hearing aid. FM radio systems require FM receivers while IR light systems need IR receivers.

FM Receiver

Courtesy of Sennheiser

IR Receiver

Courtesy of Williams Sound

The appropriate receiver must be made available to consumers by any venue employing ALSs. Within each of the latter two types of ALSs, there are a number of receiver/coupler options available.

For the person who does not use a hearing aid, headphones or earbuds can be plugged directly into a pocket-type receiver. Preferably, these should provide stimulation to both ears. This is the simplest option and is available with both FM and IR systems. In addition to the pocket-type receiver, many IR systems also provide "under-the-chin" type earphones that dangle from the ears. Other IR receivers are built into headphones, with the receiving diode on the top surface. Volume controls on all types of receivers permit users to adjust the loudness to their personal satisfaction. One type is not necessarily superior to the other; it depends upon one's personal preference. Venues should provide an adequate variety of receiver options for their patrons.

Coupling Options

Neckloop

A person wearing hearing aids has additional choices and options. Some users prefer to place headphones right over their in-the-ear hearing aids (this will not work with the type of hearing aids that fit behind the ear). In such instances of "acoustical coupling", it is necessary to balance the volume controls of the hearing aids and the FM or IR receivers in order to ensure that a comfortable loudness level is achieved. This must be accomplished without creating an audible squeal from the hearing aids (acoustic feedback) when they are covered by the headphones. If the hearing aid(s) contain telecoils, then consumers have additional choices. They can activate the telecoil (the "T" switch) and plug either a neckloop or a silhouette inductor into the earphone jack of the receiver. This will permit them to access the signal via "inductive coupling" (see illustrations). The electromagnetic field around the neckloop or silhouette is picked up by the telecoil in the same way, using the same principle, as it picks up the signals emanating from the wire loop in a large-area IL system. Some users also use inductive coupling with electromagnetic headphones by switching the hearing aids to the "T" position and placing the headphones right over their ears. A few hearing aids offer a "M/T" option, in which the user can access both the electromagnetic field and sound signals.

Silhouettes

Courtesy of Wms Sound

There are several other ways that consumers can access the signal being broadcast by ALSs, but this requires that they bring their own patch (wire) cord. Many behind-the-ear hearing aids include the option of a direct audio input (DAI) connection into the hearing aid via a "boot" that fits under the base of the hearing aid. In this instance, the user connects the IR or FM receiver to the hearing aid using the patch cord. Some consumers, particularly those with the more severe hearing losses, prefer to use direct audio input rather than inductive coupling.

A personal patch cord will also be necessary for those consumers who use a cochlear implant. These people connect the patch cord from the FM or IR receiver to their personal speech processor in the same way that a direct audio input (DAI) would connect these receivers to hearing aids. An issue with both implants and DAI is ensuring that the output jacks from the FM or IR receiver are compatible with the plugs of the connecting patch cords.

How do I know if a particular venue provides ALS?

Right now venues are not obligated to notify the public about the availability of ALSs in their public advertisements (newspapers, recorded telephone messages, TV and Radio, etc.). Some facility managers do include this information in their commercials, though others do not. Hopefully this situation will change soon, as more venues realize that it is not only the right thing to do, but good business as well (as more people with hearing loss, and their families, will begin patronizing the facility). All venues falling under the ADA, however, *are* required to post signs in prominent locations at the facility notifying the public that ALS are available (sometimes using a variant term such as "hearing assistance devices"). Furthermore, these signs should include information on exactly where in the facility the receivers can be obtained. Hopefully, such signs can be observed *before* a person purchases a ticket for some event or performance. We would advise hearing-impaired consumers planning to attend an event to call ahead and verify the availability of an ALS. This will not only provide them with the necessary information re ALSs, but can also help sensitize facility managers regarding their necessity. Even the most obtuse facility manager, faced with enough calls and demand, will soon see the light (and provide the sounds!).

***What is involved in obtaining and returning ALS receivers*?**

The location within a facility where receivers can be obtained is either included on a visible sign or can be learned by asking at the box office. One of the facility employees will usually be required to take on this responsibility. All the consumer has to do is "check" one out, usually by leaving some picture ID as surety (such as a driver's license). The facility is forbidden to ask a rental charge for the receiver. At the conclusion of the event, the picture ID is returned when the receiver is checked back in. We would recommend that consumers investigate their preferred coupling arrangement before checking out a receiver. Thus, the person should know whether he or she will use a telecoil or headphones before checking out a receiver. While the check-out employee in some venues may be knowledgeable regarding ALS, and thus could offer good advice to consumers, it would not be a good idea for consumers to depend on a high level of expertise from this person.

In some of the smaller facilities, there may not be someone designated who has ongoing responsibilities for the ALS. In these places, the receivers may be located in a closet or in someone's office. They can be stored in an unplugged charger/carrying case and placed in the back of some closet or, hidden away in some box or desk drawer with long-dead disposable batteries. In such instances, when consumers ask for a receiver, there may not be anybody present who can help them find the unit and get it working. In even the smallest of facilities, therefore, it is a good idea for someone to be assigned continual responsibilities for the receivers. There should be someone present to check them out and in and to ensure that the batteries

function, that the appropriate hygienic steps are taken (e.g. changing disposable tips or using an antiseptic spray on foam cushions), and that the transmitter of the ALS is turned on before the event commences. If these responsibilities are left to chance, or depend upon requests by consumers, the chances are that the availability of the ALS would soon be ignored in that facility. Consumers with hearing loss will simply stop attending.

What possible problems am I likely to encounter with the various systems?

The best answer to this question is probably to restate "Murphy's Law", and that is "whatever can go wrong, will!" There are a large number of problems that can potentially interfere with obtaining the full benefit of ALSs. The best response to any potential problem is an informed and assertive consumer. Passivity will get you nowhere. If you, as a consumer have a problem, *do not* grin and bear it. Let the facility manager know about the problem. If he or she doesn't know that there is a problem, it cannot possibly be rectified. Below you will find a small enumeration of some of the more common problems that consumers have reported with ALSs.

- The facility provides no prior information regarding the availability of an ALS.

- Signs indicating where the receivers can be obtained are not easily visible.

- A full range of receiver and coupler options are not available (i.e. different types of earphones and neckloops).

- When the event begins, and after the consumer is seated, finding that the system does not work because the batteries are dead or the system is not turned on.

- Reception poor with an IR system.

    - Ensure that Photo Receptor Lens is not covered (in pocket or reversed on body)
    - Try locating one's seat closer to the IR emitter (inform facility manager that the transmission characteristics need to be improved).

- Radio interference with an FM system

    - Necessary for facility to determine whether problem is occasional or persistent
    - If persistent, transmitting channels must be changed (retune receivers)

- After the event, having difficulty finding the right person or place to return the receivers (and so reclaim your driver's license!).

Is there any advantage in my owning a personal receiver?

There would be a great deal of benefit for someone to own a personal receiver, provided it was a "universal receiver", one that could access the signals transmitted by all currently available ALSs. This would include all the infrared sub-carrier frequencies, all the FM frequencies in both the 72 to 75 MHz and 216 MHz to 217 MHz bands, and the electromagnetic signals emanating

from IL systems. Unfortunately, such a “universal receiver” does not now exist. One such unit was manufactured some years ago, but has since been discontinued. We believe that there is a great deal of merit in resurrecting this concept. Such a unit would have many advantages. Hearing-impaired people owning them could take them to any facility that makes ALSs available and use them without the inconvenience of checking one out and in. Furthermore, people could be assured of a functioning receiver, one that is adjusted in accordance with their personal hearing needs. Provided that such a device could be manufactured at a reasonable cost, it would indeed be advantageous for consumers to own their personal receiver. For the most part, providers do not object in providing a transmission system (either IR or FM) in their facility. It is no extra trouble for them to piggy-back such a system on their existing sound system. What they object to is the logistics of caring for the ALS receivers. Take that responsibility away from them, and we would not only have happier providers, but a better argument to make in convincing them to provide an ALS.

This Consumer Brochure was written for the U. S. Access Board by Dr. Mark Ross, Ph.D., a principal investigator with the Rehabilitation Engineering Research Center (RERC) on Hearing Enhancement. The brochure was supported, in part, by Grant #H133E980010 from the U.S. Department of Education, the National Institute on Disability and Rehabilitation Research (NIDRR).

Glossary

Glossary

Advisory Information
Advisory information is included in an appendix to a guideline and contains additional material to assist in understanding rationale, requirements, or recommendations. All figures are considered advisory. Advisory information is not enforceable. Excerpt: "ADAAG A4.27.3 Height. Fig. A8 further illustrates mandatory and advisory control mounting height provisions for typical equipment...Electrical receptacles installed to serve individual appliances and not intended for regular and frequent use by building occupants are not required to be mounted within the specified reach ranges. Examples would be receptacles installed specifically for wall-mounted clocks, refrigerators, and microwave ovens."

Assistive Listening Systems (ALS)
Assistive listening systems augment amplification systems by transmitting the signal directly to individual receivers or hearing aids by means of infrared, inductive loop, or FM technology. Excerpt: "ADAAG 11.2.1 Courtrooms. (2) Permanently installed assistive listening systems complying with 4.33 shall be provided in each courtroom. The minimum number of receivers shall be four percent of the room occupant load, as determined by applicable State or local codes, but not less than two receivers."

Exceptions
Exceptions are permitted departures from regulatory requirements Excerpt: "309.3 Height. Controls and operating mechanisms shall be placed within one or more of the reach ranges specified in 308. EXCEPTION: This requirement does not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants."

Final Rule
A final rule is a document that has been completed under the processes of the Administrative Procedures Act, including those requiring notice and public comment. It may not yet be enforceable. For instance, the Access Board issues its guidelines as Final Rules. Excerpt: "The final rule establishes standards and procedures for the implementation of title III of the Act."

Guidelines
Guidelines comprise general, scoping, technical, and advisory material developed for reference in a regulation as a standard. Excerpt: "The Architectural and Transportation Barriers Compliance Board is issuing final guidelines to assist the Department of Justice to establish accessibility standards for new construction and alterations in places of public accommodation and commercial facilities, as required by title III of the Americans with Disabilities Act (ADA) of 1990...the Department of Justice has proposed to adopt the guidelines as the accessibility standards for new construction and alterations in places of public accommodation and in commercial facilities for purposes of title III of the ADA."

Provisions
Provisions are individual requirements within a rule, standard, or guideline. Excerpt: "Taken together, these provisions are intended to prohibit exclusion and segregation of individuals with disabilities and the denial of equal opportunities enjoyed by others, based on, among other things, presumptions, patronizing attitudes, fears, and stereotypes about individuals with disabilities. Consistent with these standards, public accommodations are required to make decisions based on facts applicable to individuals and not on the basis of presumptions as to what a class of individuals with disabilities can or cannot do."

Regulations
Regulations are legal requirements developed to implement a law or statute. Excerpt: 28 CFR Part 36 Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities, Subpart A-General, § 36.101Purpose. "The purpose of this part is to implement title III of the Americans with Disabilities Act of 1990 (42 USC 12181), which prohibits discrimination on the basis of disability by public accommodations and requires places of public accommodation and commercial facilities to be designed, constructed, and altered in compliance with the accessibility standards established by this part."

Requirements
Requirements are the regulatory criteria that must be satisfied in order to comply with a regulation or a standard. Excerpt: “ADA requirements comprise all of the regulatory mandates of titles I through V, including the standards for accessible design.”

Restricted Entrance
"ADAAG 11.1.1 Entrances. Restricted entrances are those entrances used only by judges, public officials, facility personnel or other authorized parties on a controlled basis." Excerpt: "ADAAG 11.1.1 Entrances. Where provided, at least one restricted entrance and one secured entrance to the facility shall be accessible in addition to the entrances required to be accessible by 4.1.3(8)."

Rule
A rule is a regulation. Excerpt: "The rule requires, as does the statute, that covered newly constructed facilities be readily accessible to and usable by individuals with disabilities."

Scoping
Scoping provisions specify when, how many, and under what conditions accessibility is required. Excerpt: "ADAAG 4.1.3(13) Controls and operating mechanisms in accessible spaces, along accessible routes, or as parts of accessible elements (for example, light switches and dispenser controls) shall comply with 4.27."

Secured Entrance
"ADAAG 11.1.1 Entrances. Secured entrances are those entrances to judicial facilities used only by detainees and detention officers." Excerpt: "ADAAG 11.1.1 Entrances. EXCEPTION. At secured entrances, doors and doorways operated only by security personnel shall be exempt from 4.13.9, 4.13.10, 4.13.11, and 4.13.12."

Standards
A standard is a set of requirements promulgated by an entity with rulemaking (standards-setting) authority in order to establish a basis for compliance and enforcement. Excerpt: "A facility that is constructed to meet the requirements of the rule's accessibility standards will be considered readily accessible and usable with respect to construction."

Statute
A statute is a law.

Technical Provisions
Technical provisions provide design or performance specifications for an accessible item or feature. Excerpt: "ADAAG 4.27.4 Operation. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls and operating mechanisms shall be no greater than 5 lb. (22.2N)."

Toilet Stall
A toilet stall is an enclosed space containing one water closet within a larger common use toilet room. Excerpt: "ADAAG 4.17.4 Toe Clearances. In standard stalls, the front partition and at least one side partition shall provide a toe clearance of at least 9 in (230 mm) above the floor."

UFAS
The Uniform Federal Accessibility Standards (UFAS) were published in 1984 by four Federal agencies with standards-setting authority under the Architectural Barriers Act of 1968.

Water Closet
A water closet is a toilet. Excerpt: "ADAAG 4.16.2 Clear Floor Space. Clear floor space for water closets not in stalls shall comply with Fig. 28. Clear floor space may be arranged to allow either a left-handed or right-handed approach."